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| 10/582,525 | 01/19/2007 | Jaakko Pere | Q95394 | 1046 |

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| EXAMINER | |
|---|---|
| CALANDRA, ANTHONY J | |
| ART UNIT | PAPER NUMBER |
| 1791 | |

| NOTIFICATION DATE | DELIVERY MODE |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/582,525 | PERE ET AL. | |
| | Examiner | Art Unit | |
| | ANTHONY J. CALANDRA | 1791 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *09 June 2006*.

2a)☐ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## *Detailed Office Action*

The communication dated 6/9/2006 has been entered and fully considered.

Claims 3-9 and 11-16 have been amended. Claims 1-18 are currently pending.

This is a supplemental action correcting the missing Process Variables and Optimization by LEASK reference in the IDS.

## *IDS*

The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, applications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) subsection I. states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

## *Specification*

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

1. The disclosure is objected to because of the following informalities: The specification does not provide the headings as per CFR 1.77(b).

Appropriate correction is required.

### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2-5, 7, 8, 11, 13, 16, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex*

*parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claim 2 recites the broad recitation 20:1-1:20, and the claim also recites 9:1-1:9 which is the narrower statement of the range/limitation.

In the present instance, claim 3 recites the broad recitation 5:1-1:5, and the claim also recites 3:1-1:3 which is the narrower statement of the range/limitation.

In the present instance, claim 4 recites the broad recitation 2-60%, and the claim also recites 20-55% which is the narrower statement of the range/limitation.

In the present instance, claim 7 recites the broad recitation 0.1-7 mg, and the claim also recites 3-6 mg which is the narrower statement of the range/limitation.

In the present instance, claim 8 recites the broad recitation >80 ml, and the claim also recites >100 ml which is the narrower statement of the range/limitation.

In the present instance, claim 13 recites the broad recitation >1 min, and the claim also recites 5-100 min which is the narrower statement of the range/limitation.

In the present instance, claim 18 recites the broad recitation <100 ml, and the claim also recites <80 ml which is the narrower statement of the range/limitation.

In claim 5, the applicant claims that the enzyme is produced by any bacteria produced industrially. The types of bacteria that can be used industrially will change over time as such the meaning of the claim will change over time. Additionally, even if looking at the 'time of the invention' the applicant gives no details to determine what level of use the person of ordinary skill in the art considers used industrially.

In claim 11, the applicant claims a chip size but does not state whether the size is the length, width, or thickness. The applicant has support for chip length in the specification. The claim should be amended to '…that the average chip ***length*** of the chips…'

Claim 16 provides for the use of mechanical pulp of claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 16 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

An acceptable alternate claim would be worded "A method according to claim 1, wherein the mechanical pulp is subsequently made into paper."

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claim 1, 5, 6, 8, 9, 10, 12, 13, 14, 15, and 16 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 97/40194 EACHUS et al., hereinafter EACHUS.

As for claims 1, 5, 6, EACHUS discloses chipping a raw wood material [pg. 3 lines 5-10], compressing the chips in a liquid phase contact with an enzyme preparation [pg. 6 lines 15-20], which can disintegrate structural parts of the wood [pg. 10 lines 13-15]. EACHUS then discloses refining the wood [pg. 15 lines 1-5].

EACHUS discloses that *Phanerochaete* is one of the bacteria used [claim 9] and that the biological treatment agent comprises the culture product enzymes produced therefrom [claim 7], including cellulases. The applicant claims that *Phanerochaete* is a bacteria that produces both cellobiohydrolayse and endogluconase [Instant claim 6]. Therefore the enzymatic culture of EACHUS shall treat the wood chips with both claimed enzymes.

EACHUS states the treatment amount should be sufficient quantity of the biological agent [pg. 7 lines 28-30] which the examiner has being an effective amount. EACHUS additionally shows at least on example where an effective treatment is shown to decrease the primary stage refining energy by 15% which meets the applicant's most strict definition of 'effective'.

In the alternate at the time of the invention it would have been obvious to the person of ordinary skill in the art to optimize the amount of the amount of enzyme used. EACHUS states that the purpose of the process is to have a more efficient conversion of wood chips into pulp, teaches that a sufficient amount of biological agents should be used and teaches a successful treatment with 15% energy reduction in the first stage of refining. Therefore at the time of the invention it would have been obvious to the person of ordinary skill in the art to optimize the concentration of enzymes obtained from *Phanerochaete* on wood chips to obtain the desired degree of energy decrease in refining. The amount of enzyme on wood chips is a clear result

effective variable [see e.g. MPEP 2144.05 (II) (B) Optimization of ranges and result effective variables].

As for claim 8, EACHUS teaches a refiner range of 100-200 ml freeness [pg. 12 line 13].

As for claims 9 and 10, EACHUS discloses a compression ratio of 4:1 which falls within the instant claimed ranges [pg. 13 line 4].

As for claim 12, EACHUS discloses a screw press [pg. 6 lines 25-32]

As for claim 13, EACHUS discloses the treatment time of 48 hrs which falls within the instant claimed range [pg. 13 line 9].

As for claim 14, EACHUS discloses chip steaming [pg. 8 lines 20-25].

As for claim 15, EACHUS discloses a two stage refining process without any additional chemicals or thermal treatment which is a RMP treatment, refiner mechanical pulp.

As for claim 16, EACHUS discloses that the pulp is primarily for papermaking [pg. 5 lines 3-5].

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/40194 EACHUS et al., hereinafter EACHUS.

As for claim 7, EACHUS teaches the features as per above and discloses a one enzyme treatment with 5 grams (5000 mg) of enzyme and 100 (45,359 grams) pounds of chips [pg. 12 lines 20-25, pg. 13 line 6] which is 0.11 mg protein per gram of chips which falls within the instant claimed range. EACHUS additionally teaches 55 grams (55,000 mg) of enzyme [example 4 lines 20-25] which is 1.21 grams. While EACHUS does not teach the amount of enzymes from *Phanerochaete* that should be used it would be obvious to the person of ordinary

skill in the art to optimize through routine experimentation the amount of enzymes used on wood chips to obtain a sufficient amount [pg. 7 lines 28-30] to obtain the desired amount of refining energy decrease. The amount of enzyme on wood chips, or concentration, is a clear result effective variable [see e.g. MPEP 2144.05 (II) (B) Optimization of ranges and result effective variables].

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/40194 EACHUS et al., hereinafter EACHUS in view of *Process Variables and Optimization* by LEASK, hereinafter LEASK

As for claim 11, EACHUS teaches the features as per above but fails to teach the chip size. LEASK discloses that for mechanical pulping the chip size should range from 7 mm to 22 mm [pg. 134 column 1]. At the time of the invention it wood have been obvious to use the chip size of LEASK in the mechanical pulping process of EACHUS. The person of ordinary skill in the art would be motivated to do so to obtain superior pulp quality in terms of both bonding and fiber quality [pg. 134 column 1].

6. Claims 1-10 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/40194 EACHUS et al., hereinafter EACHUS, in view of *Biodegradation and biological treatments of cellulose, hemicellulose and lignin: an overview* by PEREZ et al., hereinafter PEREZ and *Biotechnology in degradation and utilization of lignocellulose* by BRODA, hereinafter BRODA.

As for claims 1-5, 6, and 17, EACHUS discloses chipping a raw wood material [pg. 3 lines 5-10], compressing the chips in a liquid phase contact with an enzyme preparation [pg. 6 lines 15-20], which can disintegrate structural parts of the wood [pg. 10 lines 13-15]. EACHUS then discloses refining the wood [pg. 15 lines 1-5].

EACHUS discloses that *Phanerochaete* is one of the bacteria used [claim 9] and that the biological treatment agent comprises the culture product enzymes produced therefrom [claim 7], including cellulases. The applicant claims that *Phanerochaete* is a bacteria that produces both cellobiohydrolayse and endoglucoase [Instant claim 6]. Therefore the enzymatic culture of EACHUS shall treat the wood chips with both claimed enzymes. EACHUS fails to disclose the percentage of cellobiohydrolayse and endoglucoase in the culture product of *Phanerochaete.* EACHUS additionally teaches white rot fungi for wood [pg. 10 lines 5-10]. PEREZ discloses that both *Phanerochaete* and *Trichoderma reesie* are both white rot fungi [pg. 56 column 2]. At the time of the invention it would have been obvious to substitute one white rot fungus for another white rot fungus intended for the same purpose of biopulping. The person of ordinary skill in the art would be additionally motivated to do white rot treatments as per EACHUS using *Trichoderma reesie* because it is one of the most studied white rot fungi.

In addition to the above and as for claim 2, 3, 4, and 17, BRODA teaches that Trichoderma reesei produces 20-35% endoglucanases and 65-80% cellobiohydrolayses or a ratio of 4:1 (80% celliobyhydrolayse 20% endoglucanases) and 1.85:1 (65% celliobyhydrolayse 35% endoglucanases) and which falls within the instant claimed range. At the time of the invention it would have been obvious to use the cellulose extract of BRODA for the treatment of EACHUS and PEREZ to produce endogulcanases and cellobiohydrolayses in the claimed amounts. The

person of ordinary skill in the art would be motivated to do so because these amounts of enzymes are produced when *Trichoderma reesie* is given optimum growing conditions.

As for claim 7, EACHUS teaches the features as per above and discloses a one enzyme treatment with 5 grams (5000 mg) of enzyme and 100 (45,359 grams) pounds of chips [pg. 12 lines 20-25, pg. 13 line 6] which is 0.11 mg protein per gram of chips which falls within the instant claimed range. EACHUS additionally teaches 55 grams (55,000 mg) of enzyme [example 4 lines 20-25] which is 1.21 grams. While EACHUS does not teach the amount of enzymes from *Phanerochaete* or *Trichoderma reesie* that should be used it would be obvious to the person of ordinary skill in the art to optimize through routine experimentation the amount of enzymes used on wood chips to obtain a sufficient amount [pg. 7 lines 28-30] to obtain the desired amount of refining energy decrease. The amount of enzyme on wood chips is a clear result effective variable [see e.g. MPEP 2144.05 (II) (B) Optimization of ranges and result effective variables].

As for claim 8, EACHUS teaches a refiner range of 100-200 ml freeness [pg. 12 line 13].

As for claims 9 and 10, EACHUS discloses a compression ratio of 4:1 which falls within the instant claimed ranges [pg. 13 line 4].

As for claim 12, EACHUS discloses a screw press [pg. 6 lines 25-32]

As for claim 13, EACHUS discloses the treatment time of 48 hrs which falls within the instant claimed range [pg. 13 line 9].

As for claim 14, EACHUS discloses chip steaming [pg. 8 lines 20-25].

As for claim 15, EACHUS discloses a two stage refining process without any additional chemicals or thermal treatment which is a RMP treatment, refiner mechanical pulp.

As for claim 16, EACHUS discloses that the pulp is primarily for papermaking [pg. 5 lines 3-5].

As for claim 18, EACHUS teaches the abutting freeness of 100 ml but not less than . The examiner takes Official notice that freeness decreases as pulp is further refined. Further, it would be obvious to the person of ordinary skill in the art to increase the refining amount. The person of ordinary skill in the art would be motivated to increase refining (and therefore lower freeness) to increase fiber development and hence fiber strength.

7. Claim 11 rejected under 35 U.S.C. 103(a) as being unpatentable over WO 97/40194 EACHUS et al., hereinafter EACHUS, *Biodegradation and biological treatments of cellulose, hemicellulose and lignin: an overview* by PEREZ et al., hereinafter PEREZ and *Biotechnology in degradation andutilization of lignocellulose* by BRODA, hereinafter BRODA, as applied to claim 1above, and in view of *Process Variables and Optinization* by LEASK, hereinafter LEASK.

As for claim 11, EACHUS teaches the features as per above but fails to teach the chip size. LEASK discloses that for mechanical pulping the chip size should range from 7 mm to 22 mm [pg. 134 column 1]. At the time of the invention it wood have been obvious to use the chip size of LEASK in the mechanical pulping process of EACHUS. The person of ordinary skill in the art would be motivated to do so to obtain superior pulp quality in terms of both bonding and fiber quality [pg. 134 column 1].

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571)

270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Anthony J Calandra/

Examiner, Art Unit 1791

/ Carlos Lopez/

Primary Examiner, Art Unit 1791